

Message

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Sent: 7/18/2017 5:22:54 PM
To: Ken Lloyd [klloyd@raqc.org]; Amanda Brimmer [abrimmer@raqc.org]; Gordon Pierce [gordon.pierce@state.co.us]; emmett.malone@state.co.us; Kevin Briggs [kevin.briggs@state.co.us]; Ralph Morris [rmorris@ramboll.com]; Dennis McNally [dem@alpinegeophysics.com]
CC: Dolwick, Pat [Dolwick.Pat@epa.gov]
Subject: FW: Advance list of questions for CDPHE and Environ per impact of international emissions modeling

Hi Ken, Gordon,

I'm forwarding some questions from the OAQPS modelers for the call tomorrow.

Thanks,
Gail
303-312-6113

Slide 3: Can you provide a few more details about the 2011 GEOS-Chem runs (e.g., emissions outside the US, biogenic/fire emissions, meteorology, assumptions in conversion to 36km LBC, etc.)? Have these 2011 GEOS-Chem BC been used in other western U.S. applications (e.g., WAQS)?

Slide 3: Is the 36/12 (CONUS/WESTUS) 2011 base simulation the same as the WAQS modeling we've discussed? If not, what are the differences? Do you have a map of the 36km domain ... relative to the 12km domain? Are the maps on slides 14-15 for the 36km domain?

Slide 3: Interested in specific details re: how anthropogenic emissions outside the U.S. were zeroed. Were NOx, VOC, and CO emissions zeroed? Were any adjustments made to methane? Confirming that the Can/Mex emissions w/in the regional 36km domain were also zeroed in the GEOS-Chem run?

Slide 5: Was there any separate evaluation done on GEOS-Chem or MOZART (i.e., vs. satellites or sondes or ground networks outside the U.S.)?

Slide 6: Are these scatterplots for all site/days in the 12km domain from May-Aug (or is this only for the CO sites in Fig 8)? How do these values of bias, error, and esp R-square compare to previous WUS simulations? Are there any important spatial/temporal differences in performance to be aware of (e.g., does performance vary by site elevation, or month)?

Slides 6-10: The differences in 12km base MDA8s from the two global models are relatively small. Is that because the global model estimates of O3 are fairly similar at the LBC planes between GEOS-Chem and MOZART?

Slides 14-17: We are somewhat puzzled by the GEOS-Chem difference plots. Would have expected to see greater differences in Canada and Mexico. For example, the GEOS-Chem international zero out (which presumably removed Canada anthro emissions) for July has almost no impact in parts of Canada (-0.6 ppb). Are we missing something in how the international zero outs were done?

Slides 14-17: Just to confirm ... is the metric plotted here the single highest MDA8 O3 over the month. Not relevant to this discussion but looks like the CAMx 36km has some overwater issues near Norfolk (372 ppb)?

Slide 18: Did you use the test in the draft guidance (i.e., top 10 days, 3x3, RRF paired in space, etc.)?

Slide 19: Can we assume that the relatively-low but rising impacts on days 1-4 are indicative of model spinup? Was the modeling started on 5/01?

Slides 18-19: We were really surprised to see the relative consistency in day-to-day and site-to-site estimates of international impact over this period. For instance, (day-to-day) our pre-existing conceptual model of international transport would have supposed that international impacts would be maximized in the spring (Apr-Jun) when quick-transport trajectories (prompted by a further S polar jet stream) could transport O₃ and O₃ precursors from polluted upwind regions to the western U.S. For instance, in Figure 8 of Reidmiller et al. (2009) <http://www.atmos-chem-phys.net/9/5027/2009/acp-9-5027-2009.pdf>, there appears to be a factor of 3-4 dropoff in international impacts during the transition from spring to summer. Slide 19 suggests a very consistent set of impacts from May through August (6-12 ppb). Similarly (site-to-site), the conceptual model may have also guessed that higher-elevation sites would likely have more impacts from international emissions than lower-elevation sites in Denver (closer to mid-tropospheric air). The modeling suggests DV changes all between 5.2 – 7.2 ppb (except Rio Blanco which is 8.2 ... is the DVC there from winter events?). Any thoughts on the lack of spatial/temporal variability?